

**Advanced Architecting on AWS**

**Course Number:** AWS-115
**Duration:** 3 days

**Overview**

This Advanced Architecting on AWS training builds on concepts introduced in the introductory [Architecting on AWS](file:////training/aws-architecture) course. Attendees learn how to manage multiple AWS accounts and manage hybrid connectivity, devices, networking, container services, automation tools for continuous integration/continuous delivery (CI/CD), security and distributed denial of service (DDoS) protection, data lakes, data stores, edge services, migration options, and costs.

Accelebrate is an AWS Training Partner (ATP) and this hands-on official AWS Classroom Training course is taught by an accredited Amazon Authorized Instructor (AAI).

**Prerequisites**

All students must have:

* Knowledge and experience with core AWS services from the Compute, Storage, Networking, and AWS Identity and Access Management (IAM) categories
* Attended the [Architecting on AWS classroom training](file:////training/aws-architecture) OR
* Achieved the [AWS Certified Solutions Architect - Associate](https://aws.amazon.com/certification/certified-solutions-architect-associate/) certification OR
* At least one year of experience operating AWS workloads

**Materials**

All AWS students will receive comprehensive courseware.

**Software Needed on Each Student PC**

A modern web browser and an Internet connection free of restrictive firewalls, so that the student can connect by SSH or Remote Desktop (RDP) into AWS virtual machines.

**Objectives**

* Review the AWS Well-Architected Framework to ensure understanding of best cloud design practices by responding to poll questions while following a graphic presentation
* Demonstrate the ability to secure Amazon Simple Storage Service (Amazon S3) virtual private cloud (VPC) endpoint connections in a lab environment
* Identify how to implement centralized permissions management and reduce risk using AWS organizational units (OUs) and service control policies (SCPs) with AWS Single SignOn
* Compare the permissions management capabilities of OUs, SCPs, and AWS SSO with and without AWS Control Tower to determine best practices based on use cases
* Discuss AWS hybrid network designs to address traffic increases and streamline remote work while ensuring FIPS 140-2 Level 2, or Level 3 security compliance
* Explore the solutions and products available to design a hybrid infrastructure, including access to 5G networks, to optimize service and reduce latency while maintaining high security for critical on-premises applications
* Explore ways to simplify the connection configurations between applications and high-performance workloads across global networks
* Demonstrate the ability to configure a transit gateway in a lab environment
* Identify and discuss container solutions and define container management options
* Build and test a container in a lab environment
* Examine how the AWS developer tools optimize the CI/CD pipeline with updates based on nearreal-time data
* Identify the anomaly detection and protection services that AWS offers to defend against DDoS attacks
* Identify ways to secure data in transit, at rest, and in use with AWS Key Management Service (AWS KMS) and AWS Secrets Manager
* Determine the best data management solution based on frequency of access, and data query and analysis needs
* Set up a data lake and examine the advantages of this type of storage configuration to crawl and query data in a lab environment
* Identify solutions to optimize edge services to eliminate latency, reduce inefficiencies, and mitigate risks
* Identify the components used to automate the scaling of global applications using geolocation and traffic control
* Deploy and activate an AWS Storage Gateway file gateway and AWS DataSync in a lab environment
* Review AWS cost management tools to optimize costs while ensuring speed and performance
* Review migration tools, services, and processes that AWS provides to implement effective cloud operation models based on use cases and business needs
* Provide evidence of your ability to apply the technical knowledge and experience gained in the course to improve business practices by completing a Capstone Project

**Outline**

* Reviewing Architecting Concepts
	+ Review Architecting on AWS core best practices
	+ Securing Amazon S3 VPC Endpoint Communications
* Single to Multiple Accounts
	+ AWS Organizations for multi-account access and permissions
	+ AWS SSO to simplify access and authentication across AWS accounts and third-party services
	+ AWS Control Tower
	+ Permissions, access, and authentication
* Hybrid Connectivity
	+ AWS Client VPN authentication and control
	+ AWS Site-to-Site VPN
	+ AWS Direct Connect for hybrid public and private connections
	+ Increasing bandwidth and reducing cost
	+ Basic, high, and maximum resiliency
	+ Amazon Route 53 Resolver DNS resolution
* Specialized Infrastructure
	+ AWS Storage Gateway solutions
	+ On-demand VMware Cloud on AWS
	+ Extending cloud infrastructure services with AWS Outposts
	+ AWS Local Zones for latency-sensitive workloads
	+ Your 5G network with and without AWS Wavelength
* Connecting Networks
	+ Simplifying private subnet connections
	+ VPC isolation with shared services VPC
	+ Transit Gateway Network Manager and VPC Reachability Analyzer
	+ AWS Resource Access Manager
	+ AWS PrivateLink and endpoint services
	+ Configuring Transit Gateways
	+ Advanced Architecting on AWS
	+ AWS Classroom Training
* Containers
	+ Container solutions compared to virtual machines
	+ Docker benefits, components, solutions architecture, and versioning
	+ Container hosting on AWS to reduce cost
	+ Managed container services: Amazon Elastic Container Service (Amazon ECS) and Amazon
	+ Elastic Kubernetes Service (Amazon EKS)
	+ AWS Fargate
	+ Deploying an Application with Amazon EKS on Fargate
* Continuous Integration/Continuous Delivery (CI/CD)
	+ CI/CD solutions and impact
	+ CI/CD automation with AWS CodePipeline
	+ Deployment models
	+ AWS CloudFormation StackSets to improve deployment management
* High Availability and DDoS Protection
	+ Common DDoS attacks layers
	+ AWS WAF
	+ AWS WAF web access control lists (ACLs), real-time metrics, logs, and security automation
	+ AWS Shield Advanced services and AWS DDoS Response Team (DRT) services
	+ AWS Network Firewall and AWS Firewall Manager to protect accounts at scale
* Securing Data
	+ What cryptography is, why you would use it, and how to use it
	+ AWS KMS
	+ AWS CloudHSM architecture
	+ FIPS 140-2 Level 2 and Level 3 encryption
	+ Secrets Manager
* Large-Scale Data Stores
	+ Amazon S3 data storage management, including storage class, inventory, metrics, and policies
	+ Data lake vs. data warehouse: Differences, benefits, and examples
	+ AWS Lake Formation solutions, security, and control
	+ Setting Up a Data Lake with Lake Formation
* Large-Scale Applications
	+ What are edge services, and why would you use them?
	+ Improve performance and mitigate risk with Amazon CloudFront
	+ Lambda@Edge
	+ AWS Global Accelerator: IP addresses, intelligent traffic distribution, and health checks
	+ Migrating an On-Premises NFS Share Using AWS DataSync and Storage Gateway
* Optimizing Cost
	+ On-premises and cloud acquisition/deprecation cycles
	+ Cloud cost management tools, including reporting, control, and tagging
	+ Examples and analysis of the five pillars of cost optimization
* Migrating Workloads
	+ Business drivers and the process for migration
	+ Successful customer practices
	+ The 7 Rs to migrate and modernize
	+ Migration tools and services from AWS
	+ Migrating databases and large data stores
	+ AWS Schema Conversion Tool (AWS SCT)
* Capstone Project
	+ Use the Online Course Supplement (OCS) to review use cases, investigate data, and answer architecting design questions about Transit Gateway, hybrid connectivity, migration, and cost optimization